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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,842	11/12/2003	Paul S. Andry	YOR920010100US2 (8728-493)	6927
22150	7590	02/09/2005	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			HON, SOW FUN	
			ART UNIT	PAPER NUMBER

1772

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/706,842

Applicant(s)

ANDRY ET AL.

Examiner

Sow-Fun Hon

Art Unit

1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

***Withdrawn Rejections***

1. The 35 U.S.C. 112, 2<sup>nd</sup> paragraph rejections are withdrawn due to Applicant's amendment dated 11/17/04.
2. The 35 U.S.C. 102(b) rejections are withdrawn due to Applicant's amendment dated 11/17/04.

***New Rejections***

***Claim Rejections - 35 USC § 102***

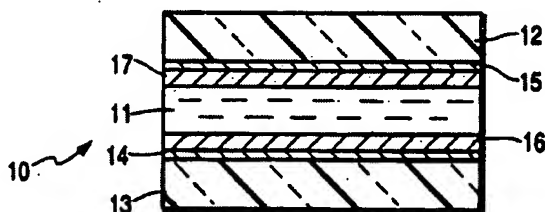
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 15, 17, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaganowicz (US 5,011,268).

Regarding claim 15, Kaganowicz has a liquid crystal display device, comprising: an alignment layer (abstract) and liquid crystal material 11 in contact with alignment layer 16 (column 3, lines 10-20).



Art Unit: 1772

Kaganowicz teaches that the material for the alignment layer includes silicon nitride which is disclosed to have a chemical formula of  $\text{SiN}_x\text{H}_y$ , where  $x = 1.2$ ,  $y = 0.5$ , which has all the properties needed for an effective alignment layer (column 3, lines 45-55). Thus the amount of ammonia or silane is introduced in order to adjust the stoichiometric ratio of the constituent materials. Kaganowicz teaches that an alignment layer with good pretilt angle is deposited (column 3, lines 15-20).

Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2112.01 [R-2]. In the instant case, the stoichiometric ratio of the constituent materials inherently provides the pretilt angle. Whether or not the amount of material is determined specifically to provide a predetermined pretilt angle is immaterial, so long as the end-product has the same pretilt angle.

Regarding claim 17, Kaganowicz teaches that the material includes  $\text{SiO}_y\text{N}_z$  (silicon oxynitride) (column 3, lines 60-70). Kaganowicz teaches that 45 sccm of ammonia, 30 sccm of silane and 60 sccm of nitrous oxide are introduced (column 3, lines 55-65). The constituent materials of the final product of silicon oxynitride are silicon, oxygen and nitrogen, which have an inherent stoichiometric relationship, which inherently provides a certain pretilt angle, as disclosed in Applicant's specification (page 13, lines 10-20). Whether or not the amount of material is determined specifically to provide a predetermined pretilt angle is immaterial, so long as the end-product has the same pretilt angle.

Regarding claim 19, Kaganowicz teaches that the material includes  $\text{SiO}_x$  (silicon oxide) (column 4, lines 45-55). The constituent materials of silicon oxide are silicon and oxygen, which have a stoichiometric relationship which inherently provides a given pretilt angle, as disclosed in Applicant's specification (page 13, lines 15-20).

Kaganowicz teaches a process of forming the alignment layer, to deposit silicon based inorganic materials to yield alignment layers which have the required (pre)tilt angle (column 3, lines 25-30), wherein the individual constituents of the materials can be adjusted (column 3, lines 45-50). In Example 1, the ammonia, which adjusts the nitride constituent (column 3, lines 45-55), can be replaced by oxygen, which adjusts the oxide component.

Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2112.01 [R-2]. In the instant case, the stoichiometric ratio of the constituent materials inherently provides the pretilt angle. Whether or not the amount of material is determined specifically to provide a predetermined pretilt angle is immaterial, so long as the end-product has the same pretilt angle.

### ***Claim Rejections - 35 USC § 103***

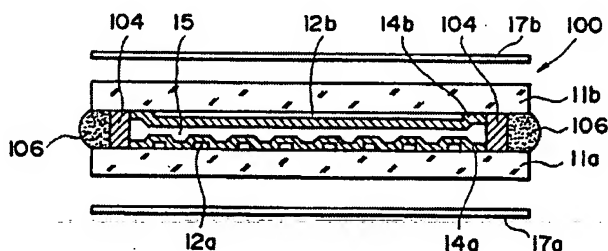
5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaganowicz as applied to claims 15, 17 above, and further in view of Onuma et al. (US 5,353,141) and Applicant's admission.

Regarding claims 16, Kaganowicz has been discussed above, and fails to teach that the material includes  $\text{SiC}_x$  wherein x is adjusted to provide the stoichiometric relationship.

Onuma has a liquid crystal display device (column 1, lines 10-15). Liquid crystal 15 (column 6, lines 45-50) is in contact with alignment layer 14a/b (column 6, lines 55-60).



Onuma teaches that SiC<sub>x</sub> (silicon carbide) can be used in place of silicon nitride (column 7, lines 1-5) to form an inorganic alignment film (column 7, lines 15-25). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used silicon carbon in place of silicon nitride as the material for forming the alignment layer of Kaganowicz, as taught by Onuma, in order to obtain an alternate alignment layer with the properties provided by silicon carbide.

Art Unit: 1772

The constituent materials of silicon carbide are silicon and carbon, which have a stoichiometric relationship which inherently provides a certain pretilt angle, as disclosed in Applicant's specification (page 12, lines 20-25). Kaganowicz teaches a process of forming the alignment layer, to deposit silicon based inorganic materials to yield alignment layers which have the required (pre)tilt angle (column 3, lines 25-30), wherein the individual constituents of the materials can be adjusted (column 3, lines 45-50). In Example 1, the ammonia, which adjusts the nitride constituent (column 3, lines 45-55), can be replaced by a carbon-containing gas, which adjusts the carbide component.

Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2112.01 [R-2]. In the instant case, the stoichiometric ratio of the constituent materials inherently provides the pretilt angle. Whether or not the amount of material is determined specifically to provide a predetermined pretilt angle is immaterial, so long as the end-product has the same pretilt angle.

Regarding claim 18, Kaganowicz has been discussed above, and fails to teach that the material includes a material having Pi-electrons.

Onuma teaches silicon carbide material (column 7, lines 1-5), which has Pi-electrons, as disclosed or admitted by Applicant, in Applicant's specification (page 11, lines 5-15).

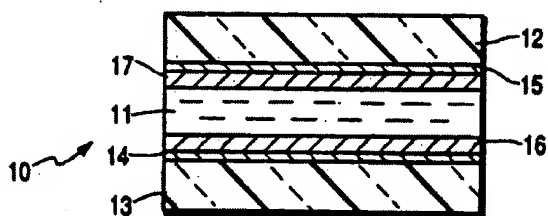
Onuma teaches that  $\text{SiC}_x$  (silicon carbide) can be used in place of silicon nitride (column 7, lines 1-5) to form an inorganic alignment film (column 7, lines 15-25). Therefore it would

Art Unit: 1772

have been obvious to one of ordinary skill in the art at the time the invention was made, to have used silicon carbon in place of silicon nitride as the material for forming the alignment layer of Kaganowicz, as taught by Onuma, in order to obtain an alternate alignment layer with the properties provided by silicon carbide which has Pi-electrons, as disclosed or admitted by Applicant.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaganowicz in view of Chaudhari et al. (US 6,195, 146).

Kaganowicz has a liquid crystal display device, comprising: an alignment layer (abstract) and liquid crystal material 11 in contact with alignment layer 16 (column 3, lines 10-20).



Kaganowicz teaches that the material for the alignment layer includes silicon nitride which is disclosed to have a chemical formula of  $\text{SiN}_x\text{H}_y$ , where  $x = 1.2$ ,  $y = 0.5$ , which has all the properties needed for an effective alignment layer (column 3, lines 45-55). Thus the amount of ammonia or silane is introduced in order to adjust the stoichiometric ratio of the constituent materials. Kaganowicz teaches that an alignment layer with good pretilt angle is deposited (column 3, lines 15-20). Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2112.01 [R-2]. In the



instant case, the stoichiometric ratio of the constituent materials inherently provides the pretilt angle. Whether or not the amount of material is determined specifically to provide a predetermined pretilt angle is immaterial, so long as the end-product has the same pretilt angle.

Kaganowicz fails to teach a non-rubbing ion beam irradiation employed on the surface of the alignment layer to control the uniformity of the pretilt angle.

Chaudhari teaches ion-beam (abstract) irradiation (exposure) on the surface of the alignment layer to adjust the pretilt angle (column 2, lines 15-25), and hence to control the uniformity of the pretilt angle. Chaudhari teaches that the irradiation method of alignment is a non-rubbing method which circumvents the problems posed by the rubbing method (column 2, lines 10-15), such as difficulty in achieving stability and uniformity (consistency) of the pretilt angle (column 1, lines 55-60).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the ion-beam irradiation method of Chaudhari in place of the rubbing method, on the of the alignment layer of Kaganowicz, in order to ensure stability and uniformity of the pretilt angle.

#### ***Response to Arguments***

8. Applicant's arguments with respect to claims 15-20 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

Art Unit: 1772

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

8H  
Sow-Fun Hon

02/07/05

  
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SUPERVISORY PATENT EXAMINER  
1772

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